

IN THE CLAIMS

Please amend the claims as follows:

1 – 24. (Cancelled)

25. (Previously Presented) A method, comprising:

sensing atrial events and ventricular events;

determining ventricular interval rates from pairs of consecutively sensed ventricular events in a detection window, the detection window including a predetermined series of the most recent consecutive ventricular events;

comparing each of the ventricular interval rates in the detection window to a lower rate threshold value for each of two or more rate zones;

classifying a ventricular interval rate of the ventricular interval rates as a fast ventricular interval for a rate zone of the two or more rate zones when the ventricular interval rate is equal to or greater than the lower rate threshold value of the rate zone;

declaring the detection window satisfied when a first predetermined percentage of the ventricular interval rates in the detection window are classified as fast ventricular intervals for the rate zone of the two or more rate zones;

starting a first time interval once the detection window is declared satisfied, the first time interval having a duration allowing monitoring and analysis of cardiac rhythms for assessing an origin of the fast ventricular intervals; and

determining whether to inhibit ventricular tachycardia therapy at the end of the first time interval based on the analysis of cardiac rhythms.

26. (Previously Presented) The method of claim 25, further comprising:

declaring that the detection window remains satisfied when a second predetermined percentage of the ventricular interval rates in the detection window are classified as fast ventricular intervals for the rate zone of the two or more rate zones; and

resetting the first time interval to zero when the detection window fails to remain

satisfied during the first time interval.

27. (Previously Presented) The method of claim 26, wherein the first predetermined percentage is greater than or equal to 65 percent, and the second predetermined percentage is greater than or equal to 45 percent.
28. (Previously Presented) The method of claim 25, wherein the analysis of cardiac rhythms includes determining an average atrial rate from the sensed atrial events and determining an average ventricular rate from sensed ventricular events, and further including inhibiting the ventricular tachycardia therapy if the average ventricular rate is not greater than the average atrial rate by at least a bias factor.
29. (Previously Presented) The method of claim 28, wherein the bias factor is programmable in the range of 5 - 20 beats per minute.
30. (Withdrawn) The method of claim 25, wherein the analysis of cardiac rhythms includes determining a ventricular rate from sensed ventricular events and determining whether an onset rate is gradual, wherein the onset rate is the rate of transition of a ventricular rate from a slower sinus rate to a tachycardia rate, and the onset rate is gradual when the onset rate is equal to or greater than an onset threshold value, and further including inhibiting the ventricular tachycardia therapy when the onset rate is gradual.
31. (Withdrawn) The method of claim 30, wherein determining whether the onset rate is gradual includes:
 - programming the onset threshold value;
 - determining a pivot point interval, the pivot point interval being a pair of adjacent ventricular intervals which has the largest decrease in value in a series of ventricular intervals occurring before the detection window is declared satisfied;
 - calculating a baseline average ventricular interval value from a predetermined number of ventricular intervals prior to the pivot point interval;

determining the difference between the baseline average ventricular interval value and the pivot point interval;

determining the difference between the baseline average ventricular interval value and each of a series of three ventricular intervals following the pivot point interval; and

declaring that the onset rate is gradual when the value of less than three of any combination of the difference between the baseline average ventricular interval value and the pivot point interval and the difference between the baseline average ventricular interval value and the series of three ventricular intervals following the pivot point interval are equal to or greater than the onset threshold value.

32. (Withdrawn) The method of claim 25, wherein the analysis of cardiac rhythms includes determining a ventricular rate from sensed ventricular events and determining whether the ventricular rate is unstable, wherein the ventricular rate is unstable when an average variance of ventricular intervals exceeds a stability interval threshold value, and further including inhibiting ventricular tachycardia therapy if the ventricular rate is unstable.

33. (Withdrawn) The method of claim 32, wherein determining whether the ventricular rate is unstable includes:

programming the stability interval threshold value;

calculating a ventricular interval difference from a series of ventricular intervals of the sensed ventricular events, wherein the series of ventricular intervals includes a current ventricular interval and a previous ventricular interval;

calculating an average ventricular interval difference from the series of ventricular intervals;

determining a variance value, VAR(n), wherein n is an integer which represents a ventricular interval of the series of ventricular intervals, and wherein VAR(n) is determined by an absolute value of a difference between the current ventricular interval and the previous ventricular interval for the series of ventricular intervals;

determining an initial ventricular interval variance value, VAR_{SEED}, wherein the VAR_{SEED} is an average variance value of VAR(1), VAR(2), VAR(3) and VAR(4),

wherein VAR(1) through VAR(4) occur immediately before the start of the first time interval;

calculating a new average ventricular interval variance after the start of the duration timer from $VAR_{SEED} * Kvar + VAR(5) * (1-Kvar)$, wherein Kvar is equal to 0.875 and VAR(5) is the ventricular interval pair following the start of the first time interval;

calculating a subsequent average ventricular interval variance, $VAR_{avg}(NEW)$, after VAR(5) using a weighted average formula: $VAR_{avg} = VAR_{avg}(NEW-1) * Kvar + VAR(n) * (1-Kvar)$, wherein Kvar = 0.875 and n is the integer representing the current ventricular interval;

comparing the subsequent average ventricular interval variance to the programmed stability interval threshold value; and

declaring that the ventricular rate is unstable when the subsequent average ventricular interval variance is equal to or greater than the programmed stability interval threshold value.

34. (Withdrawn) The method of claim 32, wherein the analysis of cardiac rhythms further includes determining an occurrence of atrial fibrillation from the sensed atrial events, and further including inhibiting ventricular tachycardia therapy if the ventricular rate is unstable and atrial fibrillation is occurring.

35. (Withdrawn) The method of claim 34, wherein determining the occurrence of atrial fibrillation from the sensed atrial events includes identifying an atrial fibrillation when more than a predetermined majority number of a set of sensed atrial intervals is shorter than an atrial fibrillation interval threshold value, and when more than a predetermined quorum number of subsequent sets of sensed atrial intervals remain shorter than the atrial fibrillation interval threshold value.

36 – 50. (Cancelled)

51. (New) The method of claim 25, further comprising programming the duration of the first time interval for each rate zone of the two or more rate zones.

52. (New) The method of claim 51, further comprising:

programming a lower rate threshold of a slow tachycardiac rate zone of the two or more rate zones to a value between 90 and 200 beats per minute; and

programming the duration of the first time interval to 1 to 60 seconds for the slow tachycardia rate zone.

53. (New) The method of claim 51, further comprising:

programming a lower rate threshold of a fast tachycardiac rate zone of the two or more rate zones to a value between 110 and 210 beats per minute; and

programming the duration of the first time interval to 1 to 30 seconds for the fast tachycardia rate zone.

54. (New) The method of claim 51, further comprising:

programming a lower rate threshold of a ventricular fibrillation rate zone of the two or more rate zones to a value between 130 and 250 beats per minute; and

programming the duration of the first time interval to 1 to 15 seconds for the ventricular fibrillation rate zone.

55. (New) A method, comprising:

sensing atrial events and ventricular events;

determining ventricular interval rates from pairs of consecutively sensed ventricular events in a detection window, the detection window including a predetermined series of the most recent consecutive ventricular events;

comparing each of the ventricular interval rates in the detection window to a lower rate threshold value for each of two or more rate zones;

classifying a ventricular interval rate of the ventricular interval rates as a fast ventricular interval for a rate zone of the two or more rate zones when the ventricular

interval rate is equal to or greater than the lower rate threshold value of the rate zone;
declaring the detection window satisfied when a first predetermined percentage of the ventricular interval rates in the detection window are classified as fast ventricular intervals for the rate zone of the two or more rate zones;
starting a first time interval once the detection window is declared satisfied, the first time interval having a duration allowing monitoring and analysis of cardiac rhythms for assessing an origin of the fast ventricular intervals; and
determining the origin of the fast ventricular intervals during the first time interval based on the analysis of cardiac rhythms.

56. (New) The method of claim 55, further comprising inhibiting a ventricular tachycardia therapy if the origin of the fast ventricular intervals is determined to be in atria.

57. (New) The method of claim 56, wherein determining the origin of the fast ventricular intervals comprises detecting atrial fibrillation.

58. (New) The method of claim 56, wherein determining the origin of the fast ventricular intervals comprises:

determining an average atrial interval rate from the sensed atrial events;
determining an average ventricular interval rate from sensed ventricular events;
and
determining whether the average ventricular interval rate is greater than the average atrial interval rate by at least a bias factor.

59. (New) The method of claim 58, further comprising programming the bias factor to 5 – 20 beats per minute.

60. (New) A system, comprising:

- means for sensing atrial events and ventricular events;
- means for determining ventricular interval rates from pairs of consecutively sensed ventricular events in a detection window;
- means for declaring the detection window satisfied when a first predetermined percentage of the ventricular interval rates in the detection window are classified as fast ventricular intervals;
- means for starting a first time interval once the detection window is declared satisfied; and
- means for determining whether to inhibit a ventricular tachycardia therapy at the end of the first time interval.

61. (New) The system of claim 60, wherein the means for determining whether to inhibit the ventricular tachycardia therapy comprises means for determining whether the fast ventricular intervals sustain during the first time interval.

62. (New) The system of claim 61, wherein the means for determining whether the fast ventricular intervals sustain comprises:

- means for declaring that the detection window remains satisfied when a second predetermined percentage of the ventricular interval rates in the detection window are classified as fast ventricular intervals; and
- means for resetting the first time interval to zero when the detection window fails to remain satisfied during the first time interval.

63. (New) The system of claim 61, wherein the means for determining whether to inhibit the ventricular tachycardia therapy comprises means for determining the origin of the fast ventricular intervals during the first time interval.